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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FEGGINS, KRISTAL J

ART UNIT PAPER NUMBER

2861

DATE MAILED: 12/20/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/438,786

Applicant(s)

HARA ET AL.

Examiner

K. Feggins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Drawings***

2. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 31 July 2001 have been approved by examiner.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 24-27, 29-31, 34-36, 40-41 & 46 are rejected under 35 U.S.C. 102(e) as being anticipated by Kobayashi et al. (6,036,299).

#### **Kobayashi et al. discloses the following claimed limitations:**

- \* an ink jet recording apparatus (see title)
- \* a flushing signal generating unit/flushing controlling means/ operable to generate a flushing signal (figs 2-5 & 8)
- \* a recording head provided with a nozzle, said recording head being operable to jet ink particles through said nozzle based on the flushing signal (col 4, lines 25-38, figs 2-5 & 8),

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\* wherein the flushing signal causes the recording head to jet ink particles through the nozzle so that each of the ink particles is a main ink particle (col 4, lines 25-38, col 5, lines 42-67, col 6, lines 1-20).

\* wherein the flushing signal generating unit is operable to generate the flushing signal as a periodic signal (col 11-col 12, lines 1-31, figs 5, 8a-8g, 9 & 17a-b)

\* the periodic signal having periodic pulses (figs 8a-8g)

\* wherein each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section<sub>3,8</sub> (col 11-col 12, lines 1-31, figs 8a-8g)

\* wherein each of the periodic pulses has the trapezoidal waveform, and wherein a gradient of the first inclined section is greater than a gradient of the second inclined section (figs 8a-8f)

\* wherein the flushing signal causes said recording head to jet ink particles through the nozzle so that each of the ink particles has a momentum greater than a predetermined value/time (col 7, lines 1-44, col 11, lines 41-55, figs 5 & 14).

\* wherein the flushing signal causes the recording head to intermittently jet the ink particles through the nozzle so that the ink particles included sets of a main/large ink

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particles and minute/small ink particles after the main/large ink particle, and the minute/small particles of the set combine with a main/large ink particle of a following set in a range of a predetermined distance from the nozzle (col 11-col 12, lines1-31, figs 5, 8a-8g, 9 & 17a-b)

\* further comprising a capping device operable to seal said nozzle of the recording head, wherein said capping device catches the ink particles jetted by said recording head through the nozzle based on the flushing signal (col 4, lines 25-38, figs 3 & 10-14)

\* a member having an opening opposite to which said nozzles of said recording head can be disposed (fig 14)

\* an ink absorbing member/waste ink tank/ disposed on the side of a bottom part of the opening (see fig 14)

\* wherein the ink particles jetted by said recording head through said nozzle based on the flushing signal are caught by/contained by/ said ink absorbing member/waste tank/ (fig 14).

\* wherein the flushing signal generating unit is operable to generate the flushing signal separate from a printing signal based on printing data (figs 2-4).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 28, 32-33 & 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Raman et al. (4,730,197).

**Kobayashi et al. discloses the following claimed limitation:**

\* wherein there is a duration of each of the pulses, a gradient of the first inclined section, a level of the potential maintaining section, and a gradient of the second inclined section (col 11, lines 66-67, col 12, lines 1-26, figs 8a-8f).

\* wherein the flashing/flushing signal is periodic signal (figs 8a-8g & 9)

\* wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section (figs 8a-8g)

\* wherein the flashing signal has a frequency (figs 8a-8f, see MPEP 2144.03)

\* wherein the predetermined distance/fixed interval from the nozzle (col 4, lines 25-38)

**Kobayashi et al. does not disclose the following claimed limitation:**

\* wherein said flushing signal generating unit is operable to generate each of the periodic pulses with a duration of  $25\mu\text{s}$ , the first inclined section with a gradient of  $10\text{V}/\mu\text{s}$ , the potential maintaining section with a level of  $20\text{V}$ , and the second inclined section with a gradient of  $9.6\text{V}/\mu\text{s}$

\* wherein said flushing signal generating unit is operable to generate the flushing signal having a frequency of  $10\text{kHz}$  or above

\* wherein the predetermined distance/fixed interval from the nozzle is  $2\text{mm}$

\* wherein said recording head is operable to jet the ink particles through said nozzle at a speed of  $5\text{m/s}$  or above

\* wherein said recording head is operable to jet ink particles through said nozzle at a speed of  $4\text{m/s}$  or above, and each of the ink jet particles has a weight of  $10\text{ng}$  or above

**However**, since it has been held that discovering an optimum value of a result effective variable and that discovering the optimum or workable ranges involves only

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routine skill in the art, *In re Bosch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and *In re Aller*, 105 USPQ 233, respectively. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a duration of each of the pulses is  $25\mu\text{s}$ , a gradient of the first inclined section is  $10\text{V}/\mu\text{s}$ , a level of the potential maintaining section is 20V, and a gradient of the second inclined section is  $9.6\text{V}/\mu\text{s}$  for the purpose of being capable of reliably overcoming faulty printing immediately after the cleaning operation; a the flashing signal that has a frequency of 10kHz or above and having a predetermined distance from the nozzle is 2mm for the purpose of providing an ink jet recording apparatus which is capable of recovering ink-droplet discharging capabilities by allowing the ink with increased viscosity in the recording head to be discharged speedily.

**Furthermore, Raman et al. disclose the following claimed limitations:**

\* wherein the predetermined distance/fixed interval from the nozzle is 2mm  
(Table, 4)

\* wherein said recording head is operable to jet the ink particles through said nozzle at a speed of 5m/s or above/at least 2m/s/ (col 7, lines 59-60) for the purpose of achieving a sufficient velocity to the droplet of ink at the nozzle in order for it to travel to the printing surface.



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\* wherein said recording head is operable to the jet ink particles through said nozzle at a speed of 4m/s or above, and each of the ink jet particles has a weight/fluid density, mass of substance per volume/ of 10ng or above. (col 7, lines 59-60, col 15, lines 26-35) for the purpose of achieving a sufficient velocity to the droplet of ink at the nozzle in order for it to travel to the printing surface.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a predetermined distance from the nozzle is 2mm; a recording head wherein the recording head is operable to jet the ink particles through said nozzle at a speed of 2m/s or above and 8m/s or above; a recording head that is operable to the jet ink particles through said nozzle at a speed of 4m/s or above, and each of the ink jet particles has a weight/fluid density, mass of substance per volume/ of 10ng or above, taught by Raman et al. into Kobayashi et al. for the purpose of providing an improved ink jet which produces optimal operating and fluidic parameter and for the purpose of achieving a sufficient velocity to the droplet of ink at the nozzle in order for it to travel to the printing surface.

7. Claims 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Barrett et al. (5,682,191).

**Kobayashi et al. discloses the following claimed limitations:**

\* a fan controller operable to stop said fan during a flushing operation in which said recording head jets ink particles through said nozzle (col 6, lines 18-20, figs 4-5).

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\* an ink absorbing member operable to absorb the ink particles jetted by said recording head through said nozzle based on the flushing signal, wherein said fan controller keeps said fan stopped at least until the ink particles jetted by said recording head through said nozzle based on the flushing signal arrive at or are caught by the ink absorbing member (col 6, lines 18-20, figs 4-5),

**Kobayashi et al. does not disclose the following claimed limitations:**

\* a fan operable to prevent a temperature rise of said ink jet recording apparatus

**Barrett et al. discloses the following claimed limitations:**

\* a fan operable to prevent a temperature rise/cool fan module/ of said ink jet recording apparatus (col 3, lines 40-47, fig 1)

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a fan for preventing a temperature rise of the recording apparatus, taught by Barrett et al. into Kobayashi et al. for the purpose of providing a cooling module within the recording apparatus.

8. Claims 42-43 & 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Nakahara (6,042,218).

**Kobayashi et al. disclose all of the claimed limitations except for the following:**

\* wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate

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different flushing signals for said plurality of nozzles for jetting the different inks, respectively.

\* a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively

**Nakahara (6,042,218) discloses the following claimed limitations:**

\* wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively. (col 2, lines 66-67, col 3-col 6, lines 4-10, 20-56, figs 2-4) for the purpose of providing an ink jet printer able to perform flushing with a reduction in unnecessary consumption of ink.

\* a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively (col 3, line 11-col 5, line 50, col 6, lines 4-10, 20-56, figs 1-4) for the purpose of reducing unnecessary ink consumption.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a recording head provided with a plurality of nozzles respectively for different inks, a flushing signal generating unit operable to generate different flushing signals for the plurality of nozzles for jetting the different inks, a plurality of flushing regions, and is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively for the purpose of providing an ink jet printer able to perform flushing with a reduction in and reducing the unnecessary consumption of ink.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 703-306-4548. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
KF

December 18, 2001

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\* an ink absorbing member operable to absorb the ink particles jetted by said recording head through said nozzle based on the flushing signal, wherein said fan controller keeps said fan stopped at least until the ink particles jetted by said recording head through said nozzle based on the flushing signal arrive at or are caught by the ink absorbing member (col 6, lines 18-20, figs 4-5),

**Kobayashi et al. does not disclose the following claimed limitations:**

\* a fan operable to prevent a temperature rise of said ink jet recording apparatus

**Barrett et al. discloses the following claimed limitations:**

\* a fan operable to prevent a temperature rise/cool fan module/ of said ink jet recording apparatus (col 3, lines 40-47, fig 1)

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a fan for preventing a temperature rise of the recording apparatus, taught by Barrett et al. into Kobayashi et al. for the purpose of providing a cooling module within the recording apparatus.

8. Claims 42-43 & 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (6,036,299) in view of Nakahara (6,042,218).

**Kobayashi et al. disclose all of the claimed limitations except for the following:**

\* wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively.

\* a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively

**Nakahara (6,042,218) discloses the following claimed limitations:**

\* wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said flushing signal generating unit is operable to generate different flushing signals for said plurality of nozzles for jetting the different inks, respectively. (col 2, lines 66-67, col 3-col 6, lines 4-10, 20-56, figs 2-4) for the purpose of providing an ink jet printer able to perform flushing with a reduction in unnecessary consumption of ink.

\* a plurality of flushing regions, wherein said recording head is provided with a plurality of nozzles respectively for different inks, and said recording head is operable to jet ink particles of the different inks through said plurality of nozzles to be caught in said plurality of flushing regions, respectively (col 3, line 11-col 5, line 50, col 6, lines 4-10, 20-56, figs 1-4) for the purpose of reducing unnecessary ink consumption.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a recording head provided with a plurality of nozzles respectively for different inks, a flushing signal generating unit operable to generate different flushing signals for the plurality of nozzles for jetting the different inks, a plurality of flushing regions, and is operable to jet ink particles of the different inks

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through said plurality of nozzles to be caught in said plurality of flushing regions, respectively for the purpose of providing an ink jet printer able to perform flushing with a reduction in and reducing the unnecessary consumption of ink.

***Response to Arguments***

Applicant's arguments with respect to claims 24-50 have been considered but are moot in view of the new ground(s) of rejection.

***Communication with the USPTO***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 703-306-4548. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on 703-308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

KF  
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December 19, 2001



**N. Le**  
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